User's Guide

IEEE 802.11b

Wireless LAN PC Card

Version3.10

Table of Contents

INFORMATION TO USER

FCC INFORMATION

FCC Radiation Exposure Statement

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment.

This equipment should be installed and operated with minimum distance 20cm between the radiator & your body.

This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

The equipment has been tested and found to comply with the limits for a Class B Digital Device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction, may cause harmful interference to radio communication. However, there is no grantee that interference will not occur in a particular installation. If this equipment dose cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

--Reorient or relocate the receiving antenna.

--Increase the separation between the equipment and receiver.

--Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

--Consult the dealer or an experienced radio/TV technician for help.

Notice: The Part 15 radio device operates on a non-interference basis with other devices operating at this frequency. Any changes or modification not expressly approved by the party responsible could void the user's authority to operate the device.

REGULATORY INFORMATION

The Wireless LAN PC Card must be installed and used in strict accordance with the manufacturer's instructions. This device complies with the following radio frequency and safety standards.

USA - Federal Communications Commission (FCC)

This device complies with Part 15 of FCC Rules. Operation is subject to the following two conditions:

1. This device may not cause harmful interference.

2. This device must accept any interference that may cause undesired operation.

Europe - R&TTE Directive

This device complies with the specifications listed below

• ETS 300-826 General EMC requirements for Radio equipment.

• ETS 300-328 Technical requirements for Radio equipment.

• EN60950 Safety Requirements for Radio equipment

1. Introduction

Thank you for purchasing Wireless Local Area Net (WLAN) PC Card. You are about to install a networking system that is not only fast and powerful, but also easy to set up and simple to maintain. In a short time you and those in your network will be able to share a local printer and files, access the Internet, and roam about the office wire-free.

Using radio frequency (RF) technology, WLANs transmit and receive data over the air, minimizing the need for wired connections. Thus, WLANs combine data connectivity with user mobility, and, through simplified configuration, enable movable LANs.

This wireless networking solution has been designed for both large and small businesses, and it is scalable so that you can easily add more users and new network features as your business grows.

This manual will assist you in the installing WLAN PC Card.

2. Wireless LAN basics

Wireless LAN network defined by IEEE 802.11b standard committee could be configured as:

- **Ad Hoc wireless LAN,** or
- **Infrastructure wireless LAN.**

Ad Hoc network is a group of notebooks with wireless LAN PC card called a BSS (Basic Service Set). These notebooks use their wireless LAN PC cards to communicate with each other, and notebooks cannot connect to the **Internet**.
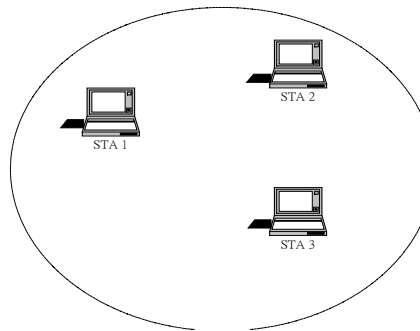

Figure 2-1 Ad Hoc wireless network

The most obvious differentiation between **Infrastructure** wireless network and **Ad Hoc** wireless network is that the notebooks in **Infrastructure** wireless network can make use of the resource in the Internet through **Access Point**.
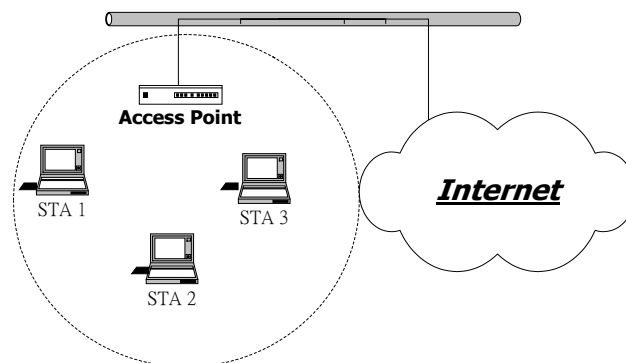
Figure 2-2 Infrastructure wireless network

To set up your notebook's network as the type of "**Ad Hoc**" or "**Infrastructure**" wireless network depends completely on your requirement. Generally, if your network environment has an **Access Point**, we recommend that you set it as "**Infrastructure**" to connect to the **Internet**.

3. Windows Installation

This section describes the procedures for installing the Wireless LAN PC Card under Windows 98 SE and Windows XP operating system.

Before You Start

To use the WLAN PC card with a computing device, the device must be equipped with an internal or external PCMCIA Card Type II or Type III slot. All drivers and supporting software for the WLAN PC Card must be loaded and configured.

Ask your system administrator for the following information, which you may need to provide during driver installation:

- Your Wireless Client Name
- Your Wireless SSID
- Your computer's unique client name and workgroup name
- For your network account, your user name and password.
- Your IP address, gateway address, and subnet mask if you're not using a DHCP server.

Every computer on a network is identified by a unique network address. There are two methods of assigning network addresses to computer on a TCP/IP network:
- Static IP addressing
- Dynamic IP addressing (DHCP)

In networks with static IP addressing, the network administrator manually assigns an IP address to each computer. Once a static IP address is assigned, a computer uses the same IP address every time it reboots and logs on to the network. You may manually change the IP address in the **Network Properties dialog box**. Networks using static IP addresses are easy to set up and do not require additional network management software.

In networks with dynamic IP addressing, a DHCP server in the network dynamically assigns IP addresses to all clients every time they log on to the network. Network using dynamic IP addresses require setting up and running a DHCP Server or installing the Wingate software package.

3.1 Install Wireless LAN PC Card under Windows 98

Step 1. Hold the PC card with the logo facing up, and insert the card into the slot, applying just enough pressure to make sure it is fully seated. **Windows 98** automatically detects the PC card, briefly opens a New Hardware Found window, and starts collecting information for a driver information database. When **Windows 98** is ready to configure the new hardware, it opens the **Add New Hardware Wizard** dialog box as shown, Click **Next**.
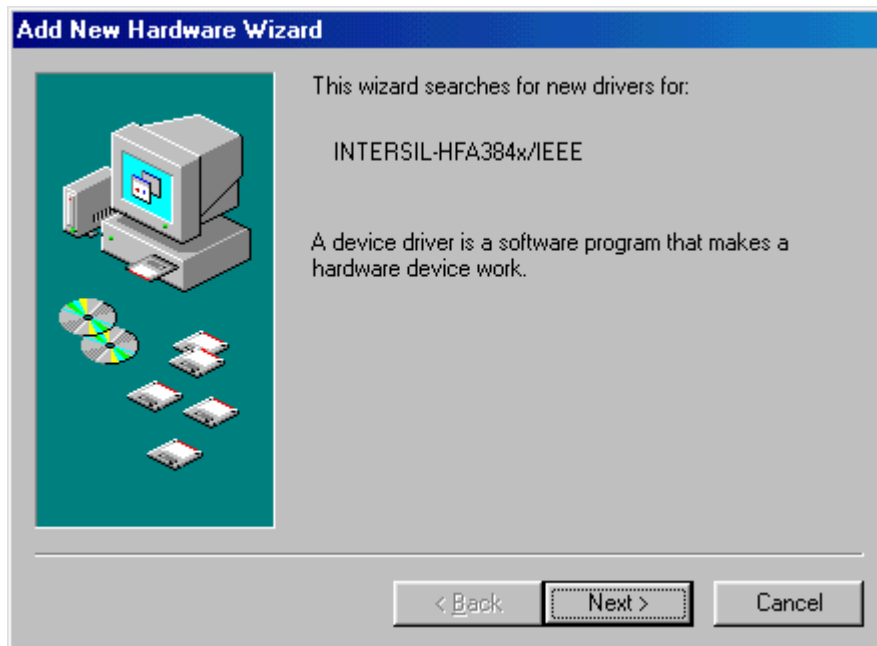

Step 2. A dialog box appears asking what do you want Windows to do. Select **Search for the best driver for your device (recommended)** and click **Next**.

Step 3. Select **Specify a location**, insert the documentation CD, and click **Browse** to select WLAN PC Card folder from CD Drive.

Step 4. Select the folder that contains driver in CD-ROM, then click **OK** returns to previous menu and click **Next**.
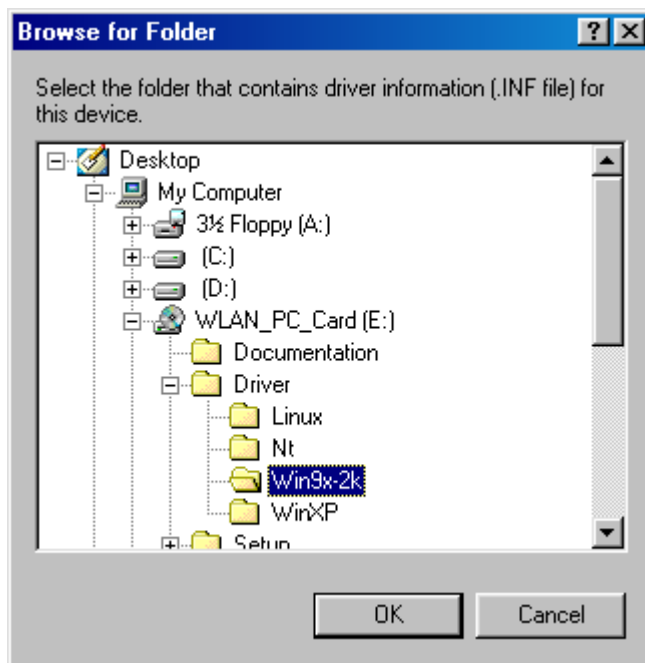
Step 5. After the hardware wizard finds the installation files in the software CD, it displays the search results:" Windows driver file search for the device: PRISM2 IEEE 802.11 PC CARD Adapter." Click **Next** to copy the required files.


Step 6. Starting Copy
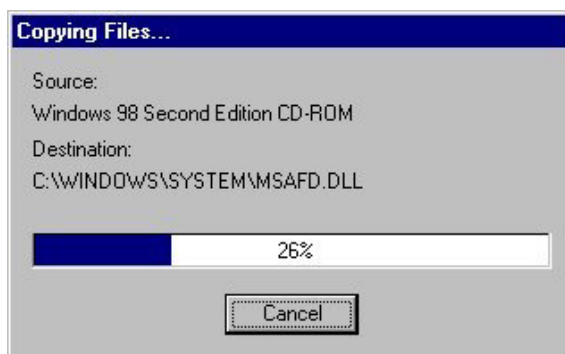
Step 7. The **Add New Hardware Wizard** window appears stating that Windows has finished installing the software that your new hardware device requires. Click **Finish**.
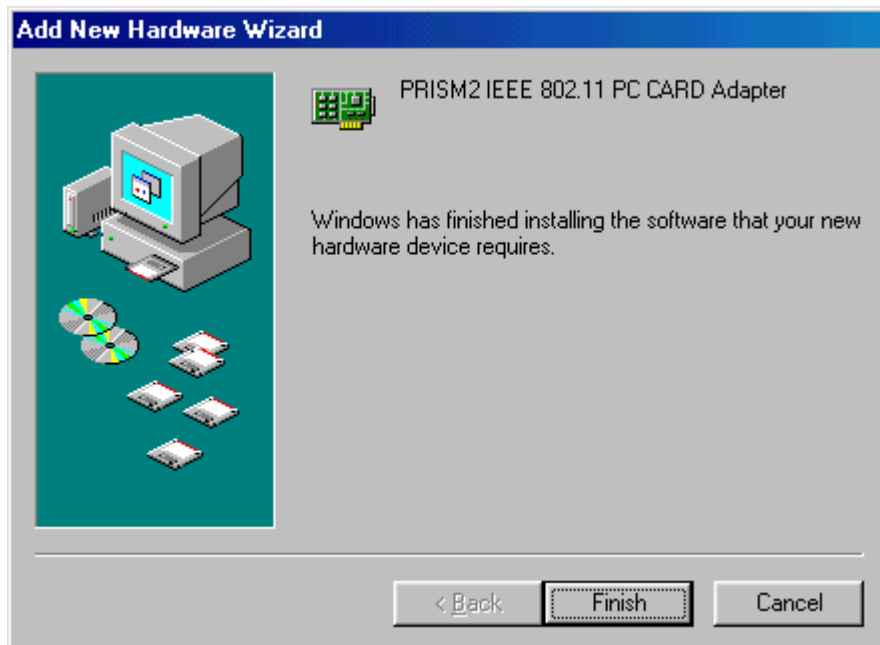
Step 8. The System Settings Change window states:" To finish setting up your new hardware, you must restart your computer. Do you want to restart your computer now?" Remove the software CD and click **Yes** to restart the computer.
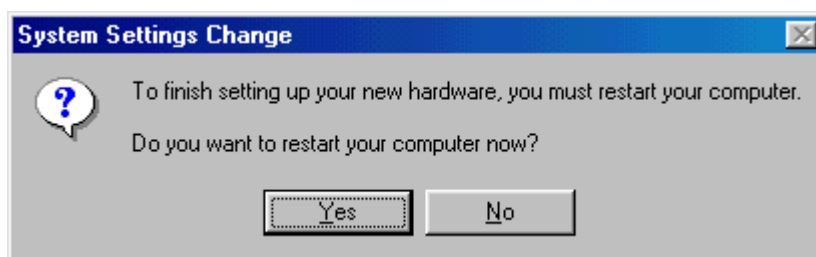
Step 9. After the computer restarts, double click the **My Computer** icon on your desktop. In My Computer window, double click the **Control Panel** icon. In Control Panel window, double click the **Network** icon.

Step 10. Select the **TCP/IP->PRISM2 IEEE 802.11 PC CARD Adapter** for setting the IP address. Click **Properties**.
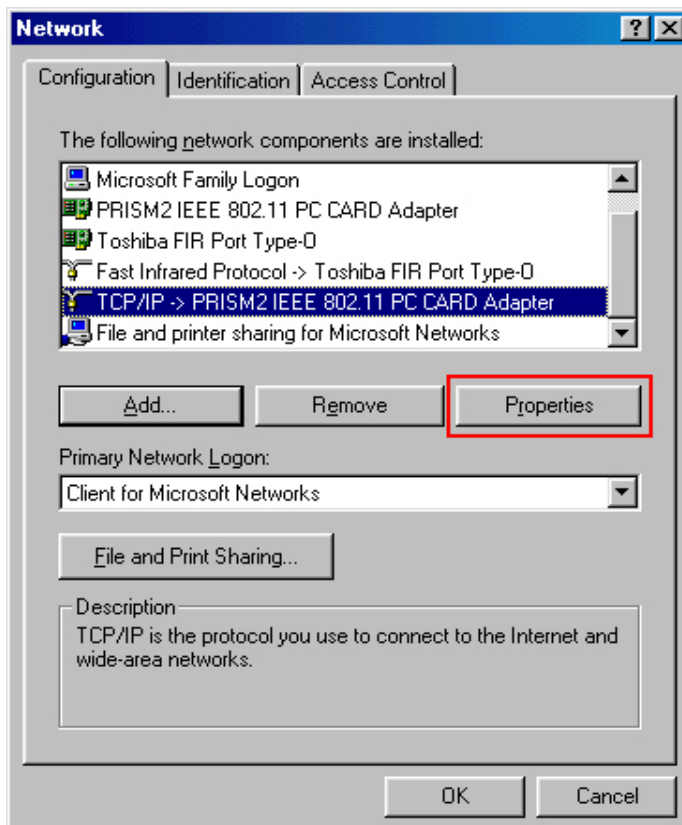
Step 11. Set **IP address** and **Subnet Mask**. You can select either **Static** or **DHCP** setting. If you use the static IP setup then please enter the IP address and Subnet masking. You should ask your network administrator for an address, and then type it into the blanket boxes as below. Then click **OK** to return to Step 10 *Network* dialog box.
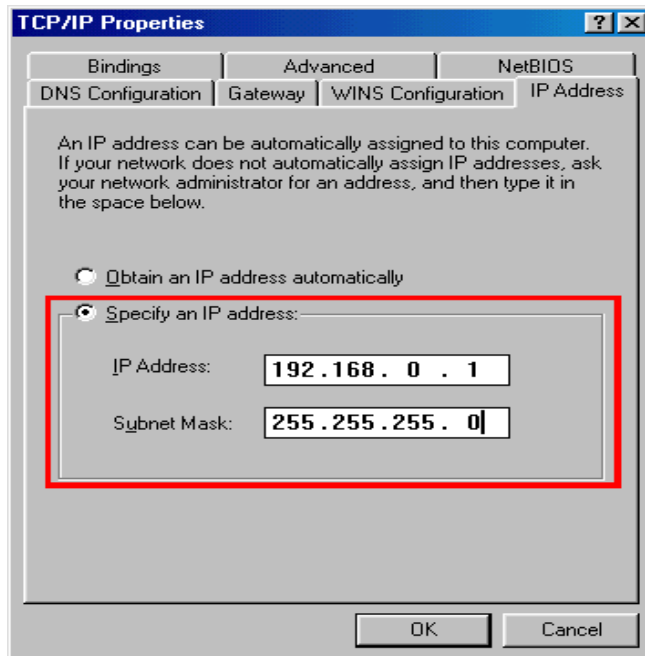
If your network has a DHCP server and Access Point supports DHCP. IP address can be automatically assigned to this device. Choose **Use DHCP for WINS Resolution** in WINS Configuration then clicks **OK** to return to Step 10 *Network* dialog box.
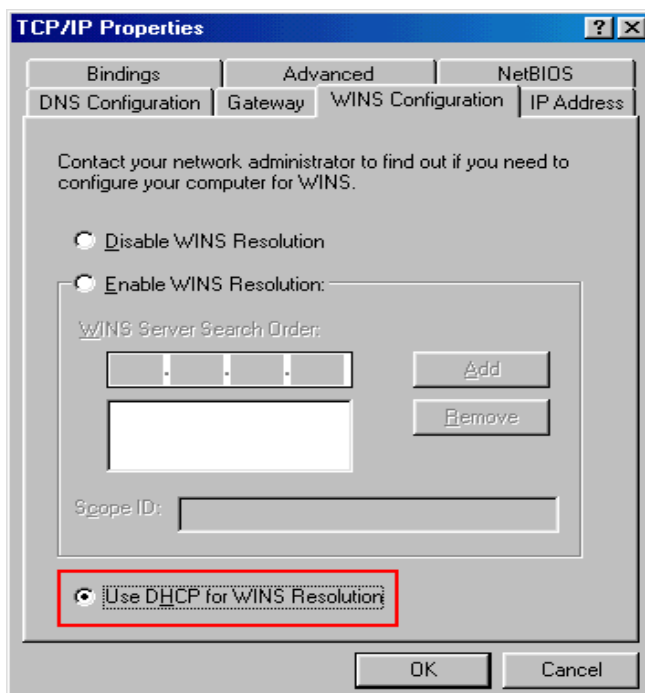
Step 12. Click **Add** to add Network Protocol.
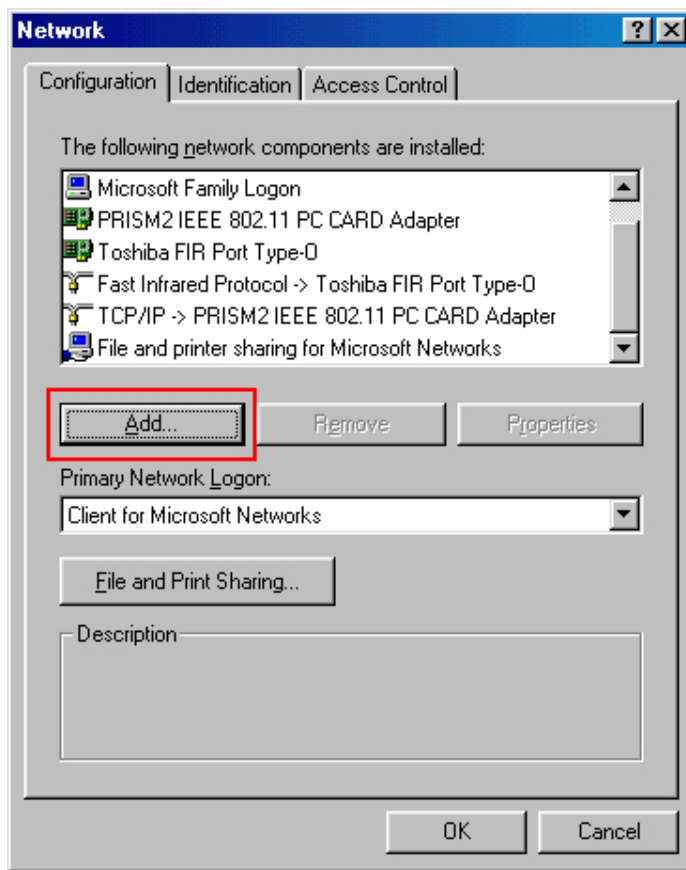
Step 13. Select the type of network component you want to install, and then click **Add**.
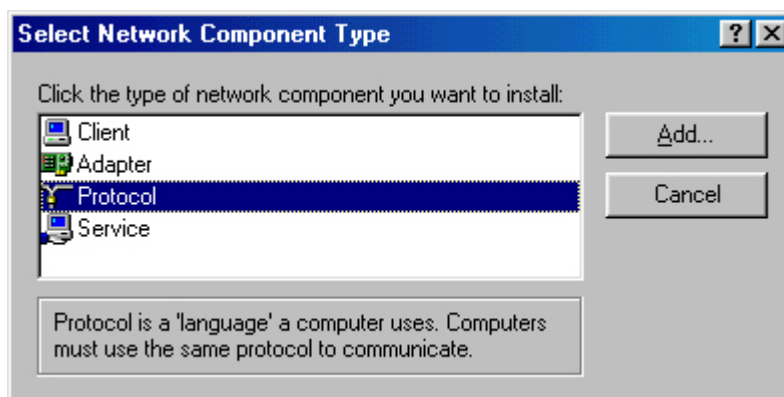
Step 14.   Select Network Protocols box appears. From the list of manufactures, click on **Microsoft**. From the list of network protocols list, select **NetBEUI**, then click **OK**.
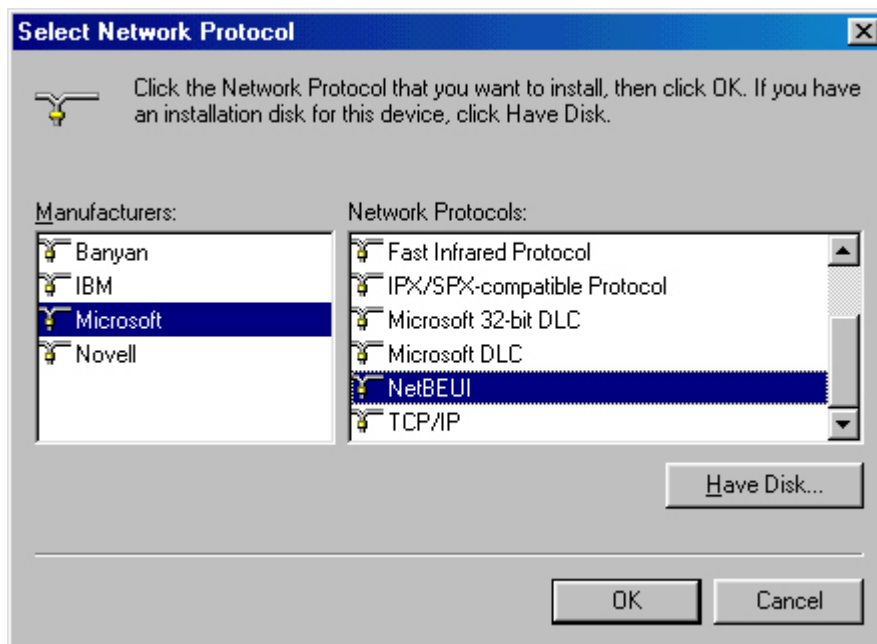
Step 15.   The **NetBEUI** protocol is now installed. After clicking on **OK** return back to Network Component Type box, then click **OK**.
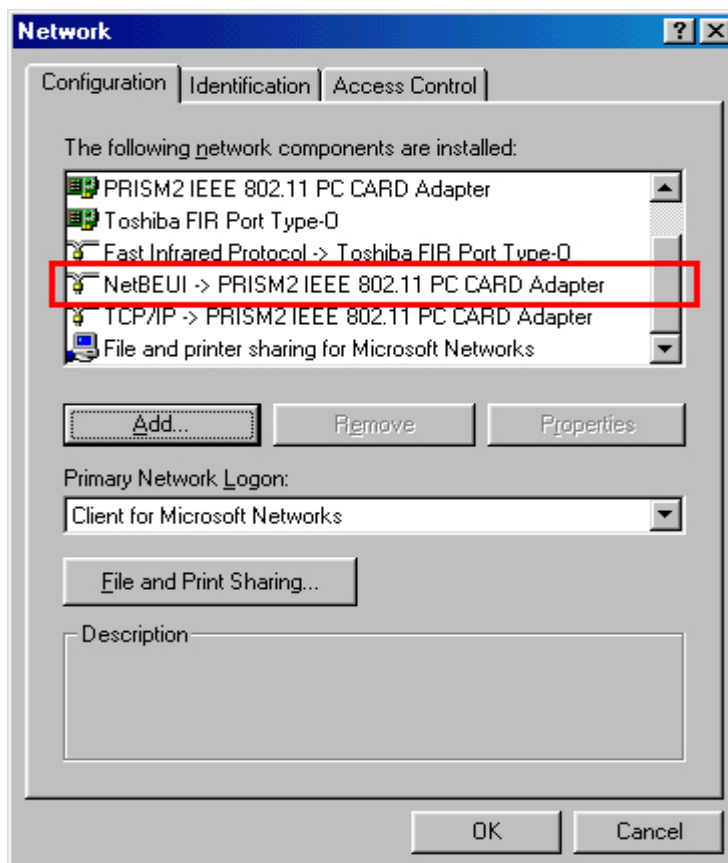
Step 16.   The System Settings Change: " To finish setting up your new hardware, you must restart your computer. Do you want to restart your computer now?" Click **Yes** to restart the computer.
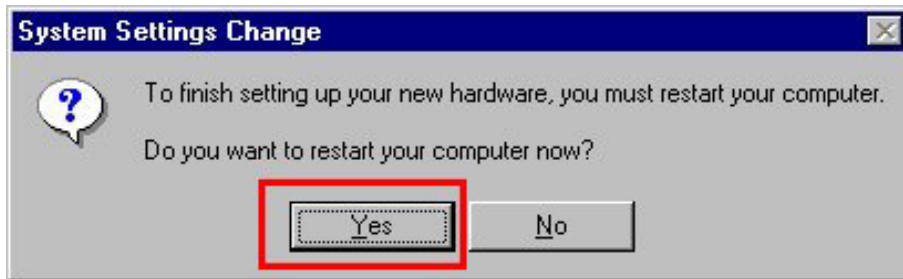
## 3.2 Install Wireless LAN PC Card under Windows XP

Step 1. Hold the PC card with the logo facing up, and insert the card into the slot, applying just enough pressure to make sure it is fully seated. **Windows XP** automatically detects the PC card, briefly opens a New Hardware Found window, and starts collecting information for a driver information database. When **Windows XP** is ready to configure the new hardware, it opens the **Found New Hardware Wizard** dialog box as shown,

A dialog box appears asking what do you want Windows to do. Select Install the software automatically (Recommended) and, Click **Next**.
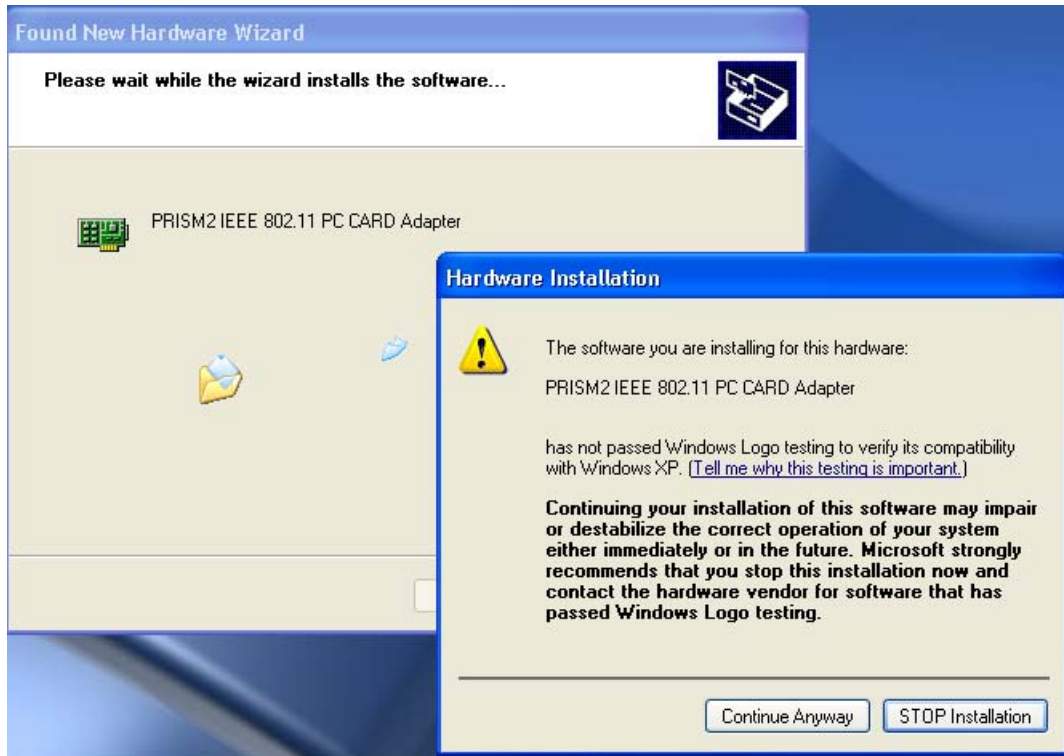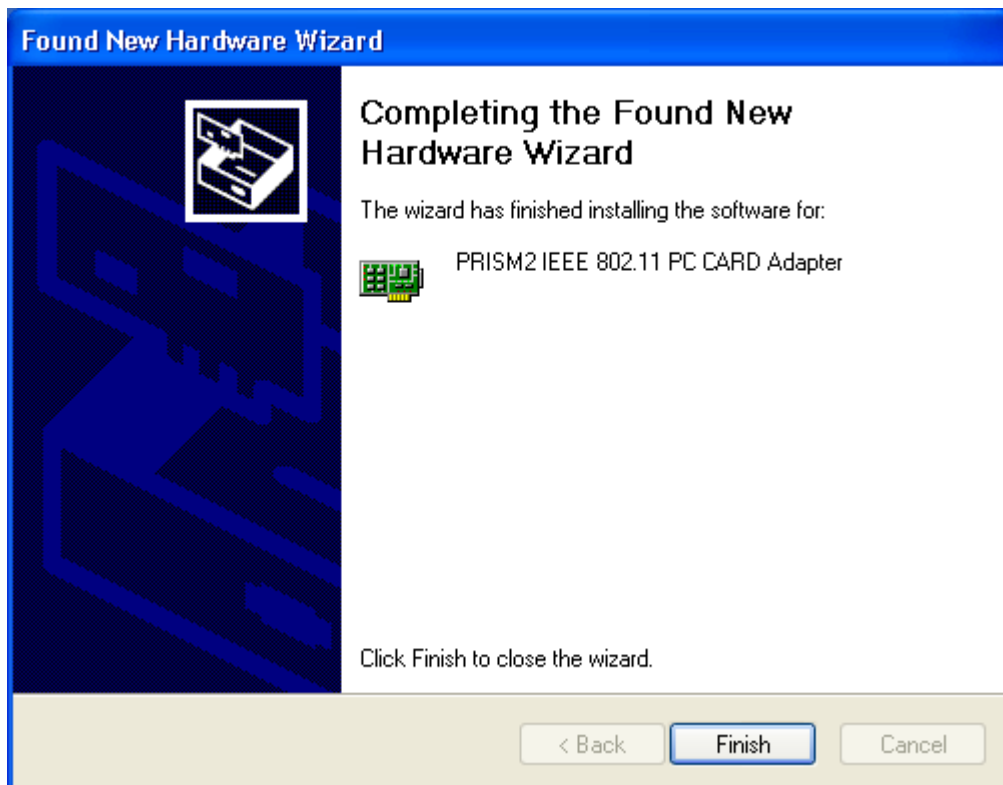

Starting search the driver automatically.
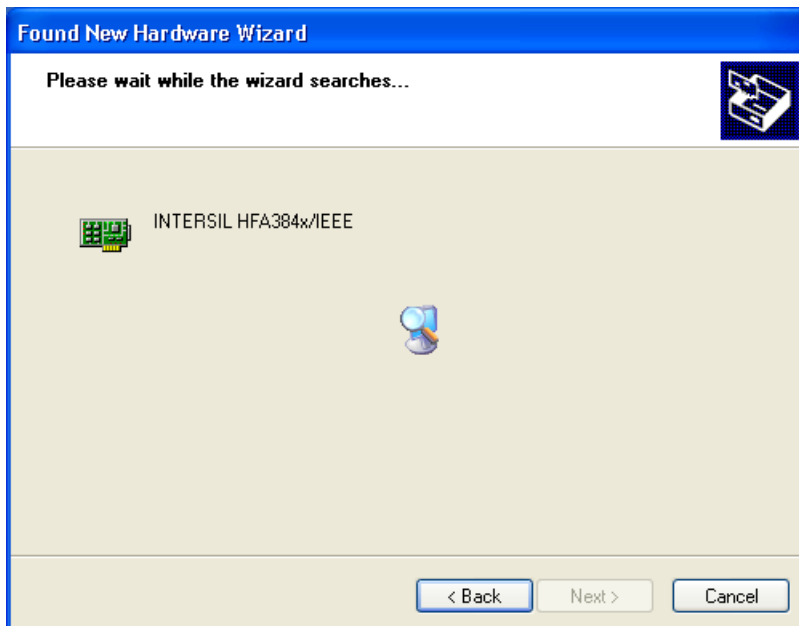
Step 2. Select the **e:\driver\winxp\netcw10.inf** and Click **Next** to copy the required files.
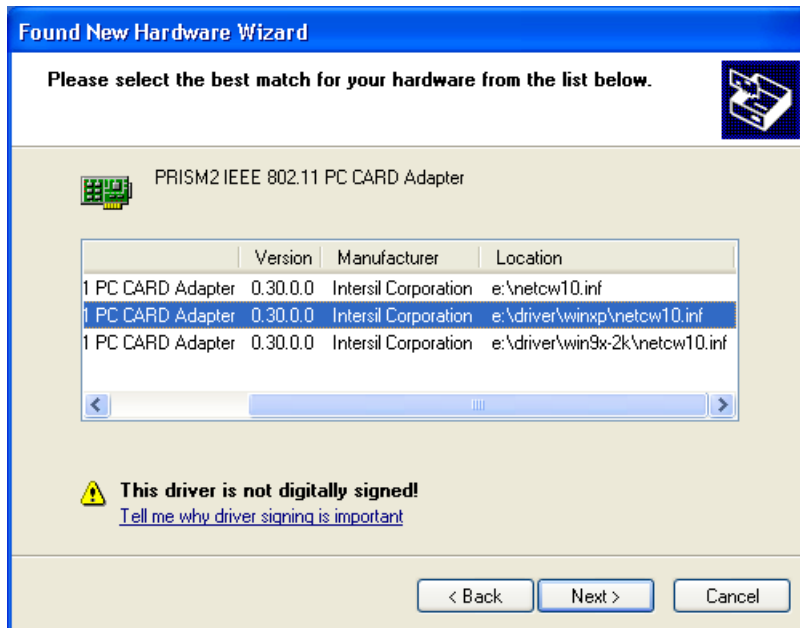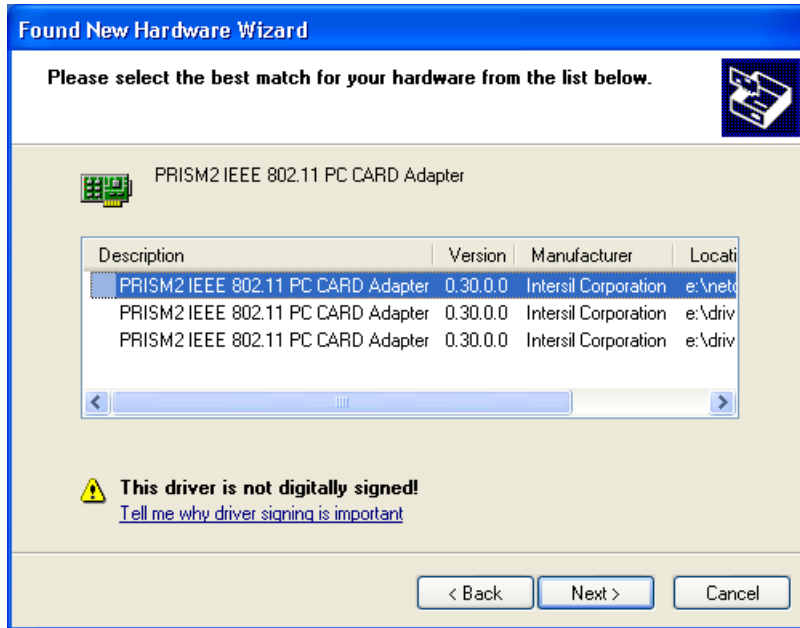
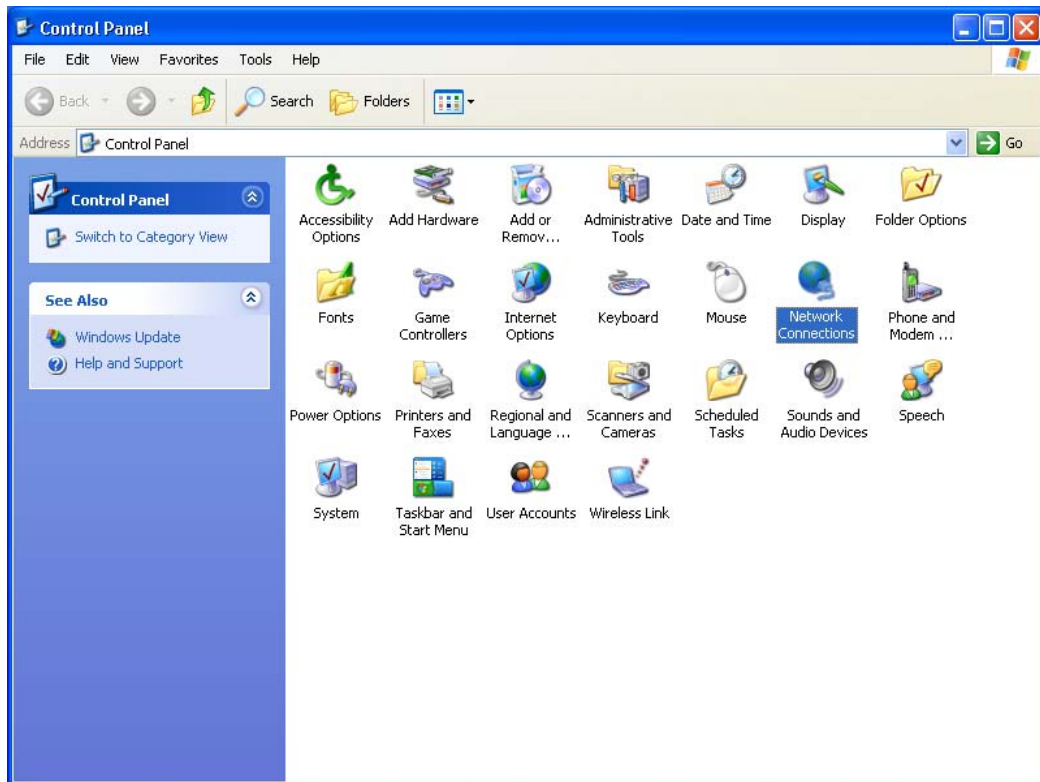Step 3. Click **Continue Anyway**.

Step 4. The **Found New Hardware Wizard** window appears stating that Windows has finished installing the software that your new hardware device requires. Click **Finish**.
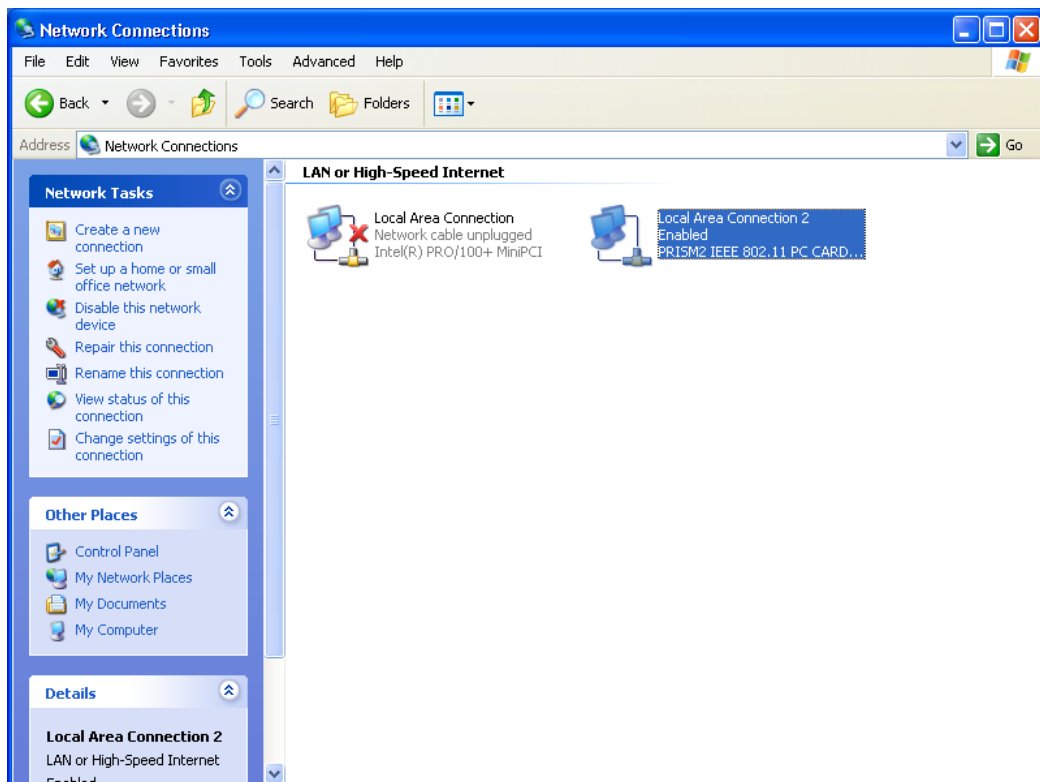
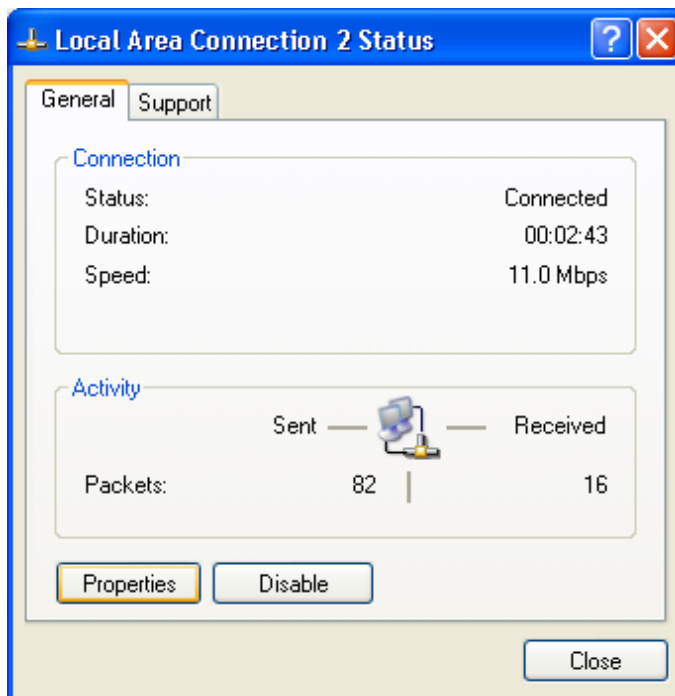Step 5. Click **Start** menu and select **Control Panel.**

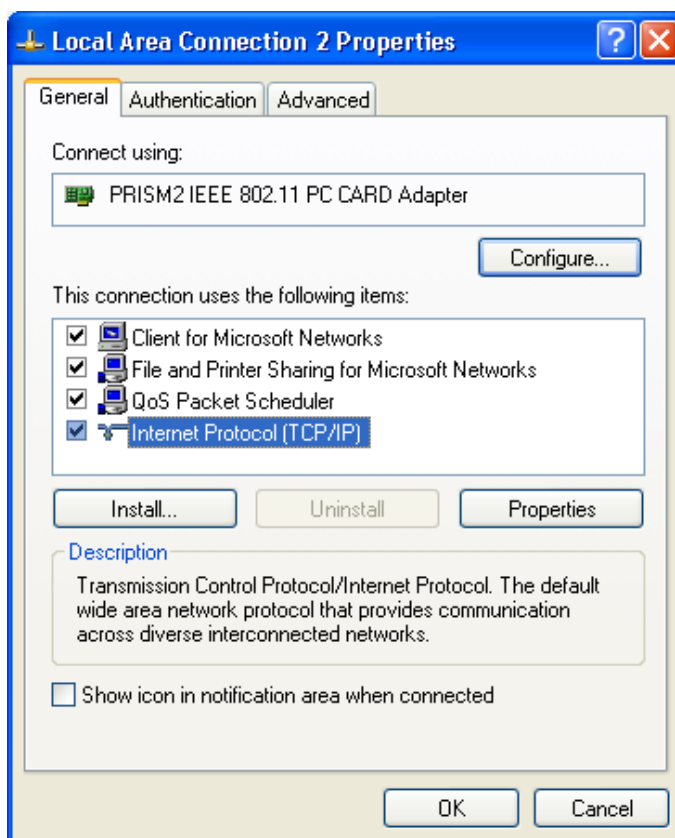Double click the **Network Connections** icon in the **Control Panel**.

Step 6. Double click the **PRISM2 IEEE 802.11 PC Card** local area connection icon.

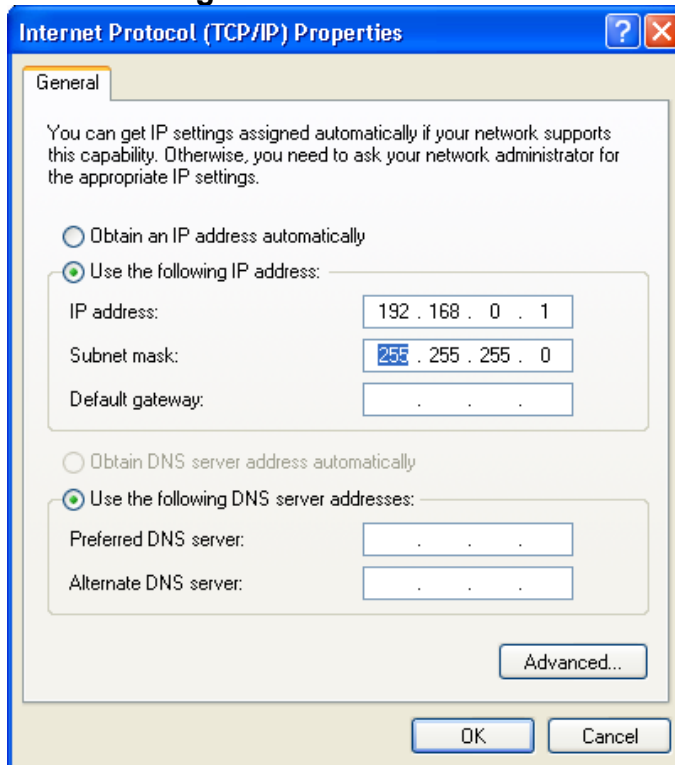Step 7. Double click **Properties** to configuration network protocol.

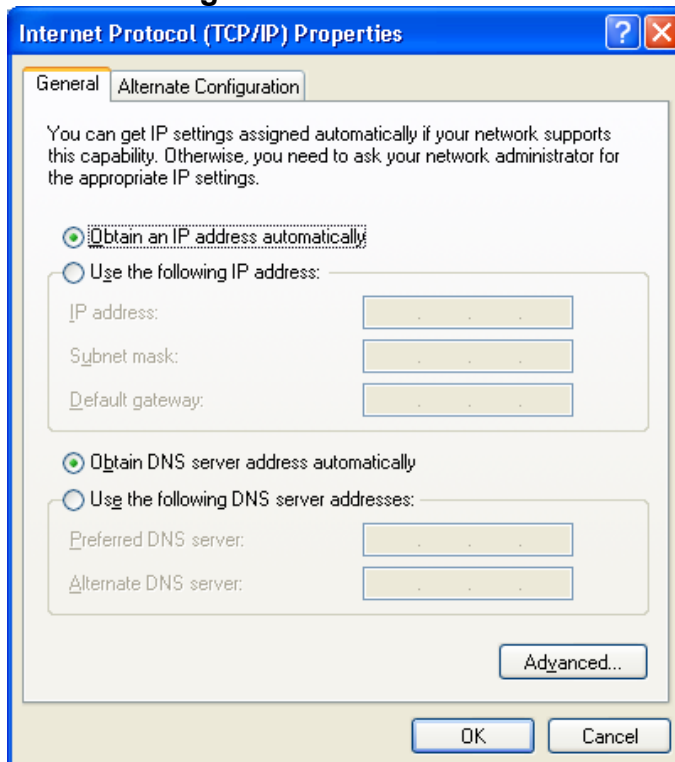Step 8. Select **Internet Protocol (TCP/IP)** and click **Properties**

Step 9. Set **IP address** and **Subnet Mask**. You can select either **Static** or **DHCP** setting. If you use the static IP setup then please enter the IP address and Subnet masking. You should ask your network administrator for an address, and then type it into the blanket boxes as below. Then click **OK** to return to Step 8. **Local Area Connection Properties** dialog box.
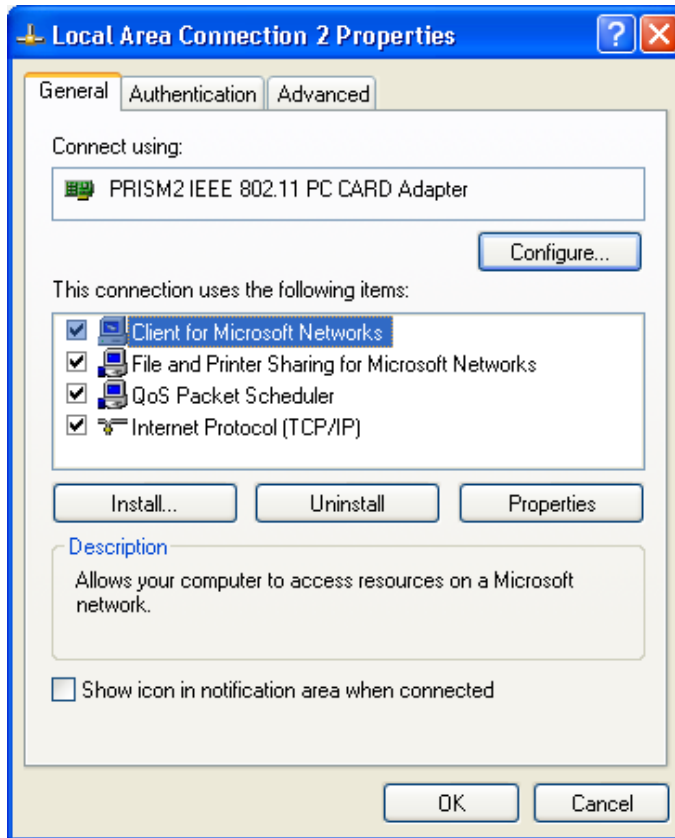
Static setting

DHCP setting

Step 10. Click **Install** to add Network Protocol.

Step 11. Select **Protocol** and click **Add**.
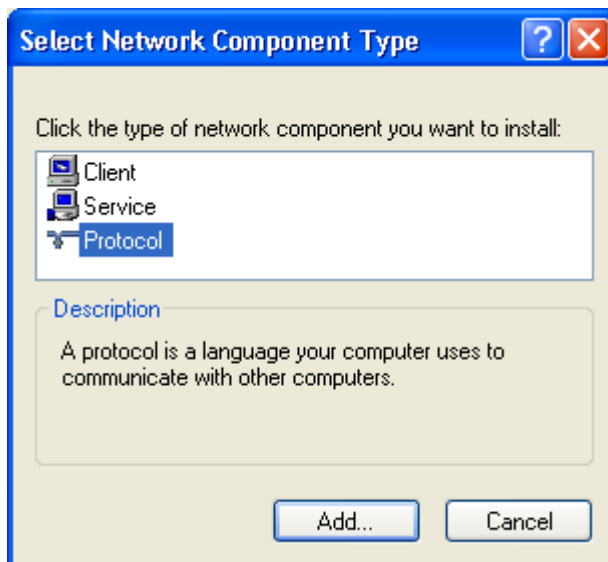
Step 12. Select protocol as the figure showing and click **OK**.
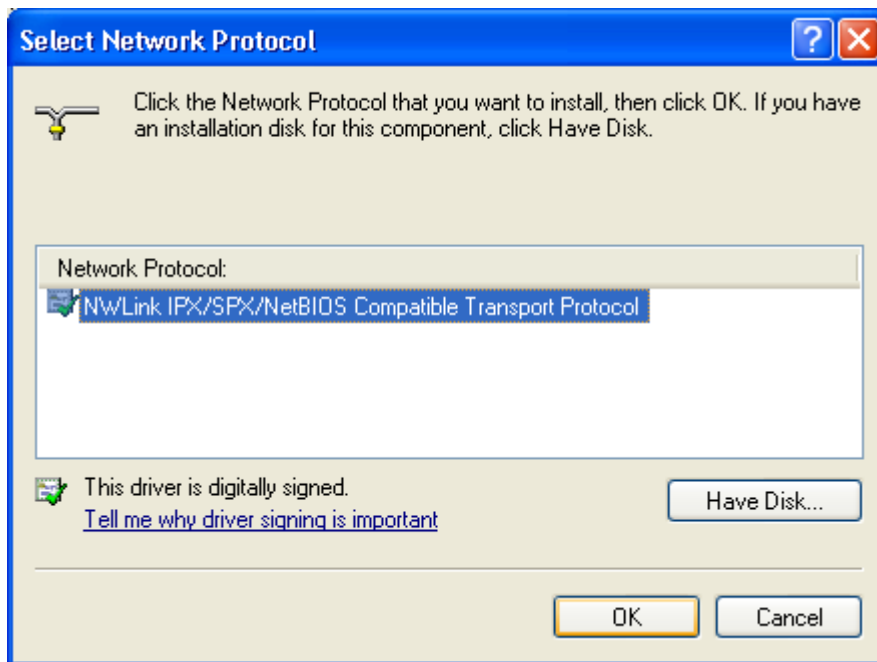
Step 13. The **IPX/SPX/NetBEUI** protocol is now installed. After clicking on **Close** return back to **Local Area Connection Status** box, then click **Close**.
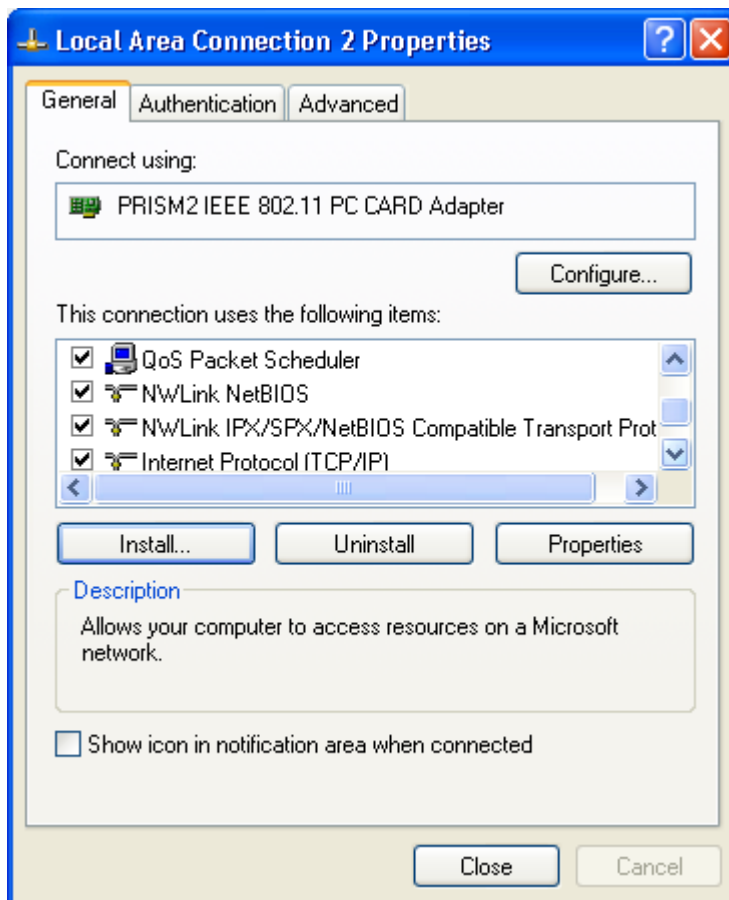
3.3 Install Utility

Step 1. Double click the **MY Computer** icon on your desktop. In my computer window, double click the **CD Drive** icon. Choose WLAN PC Card folder and double click **Step** icon to execute **Setup.exe**. It opens the **Welcome** dialog box as shown then click **Next**.
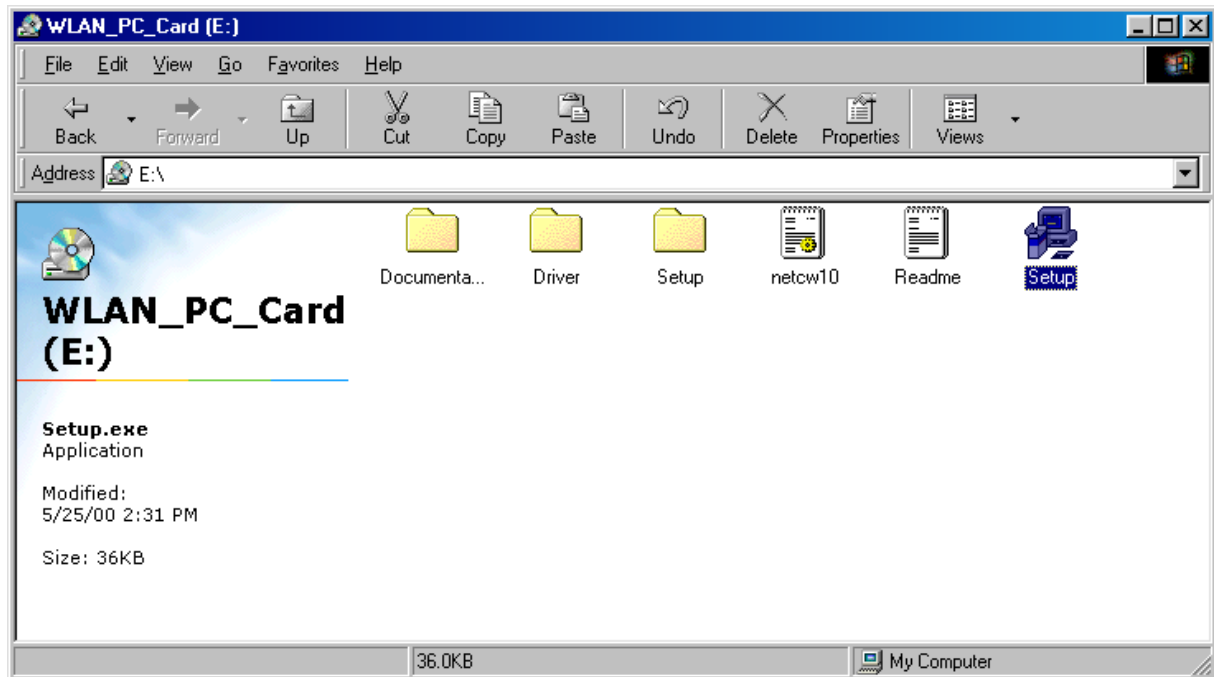
Step 2. Choose the Wireless Adapter what you use, and then click **Next**.
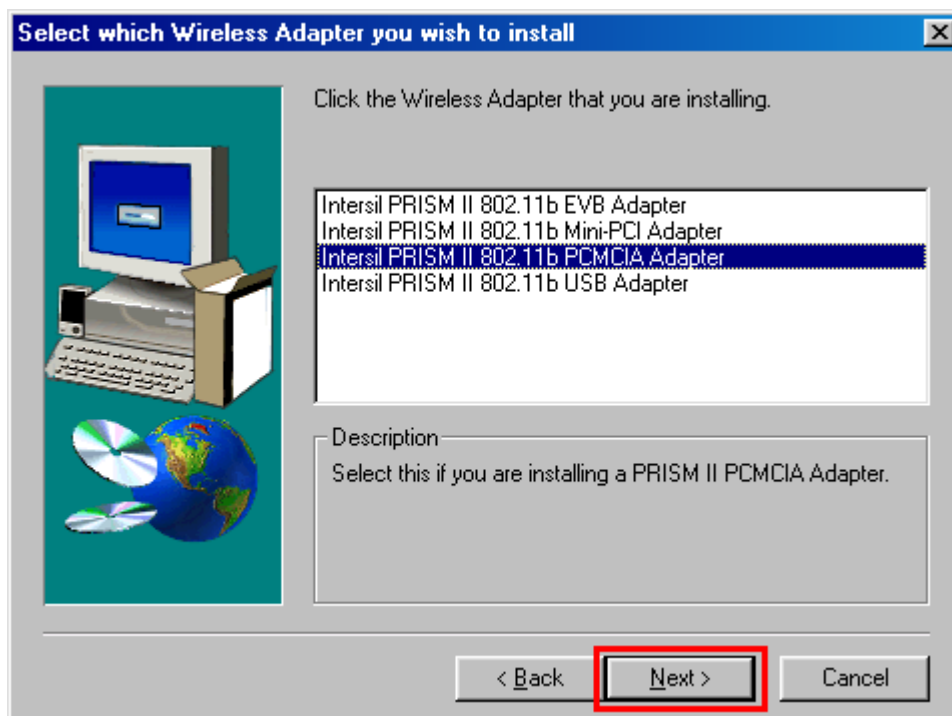
Step 3. Welcome dialog, please click **Next**
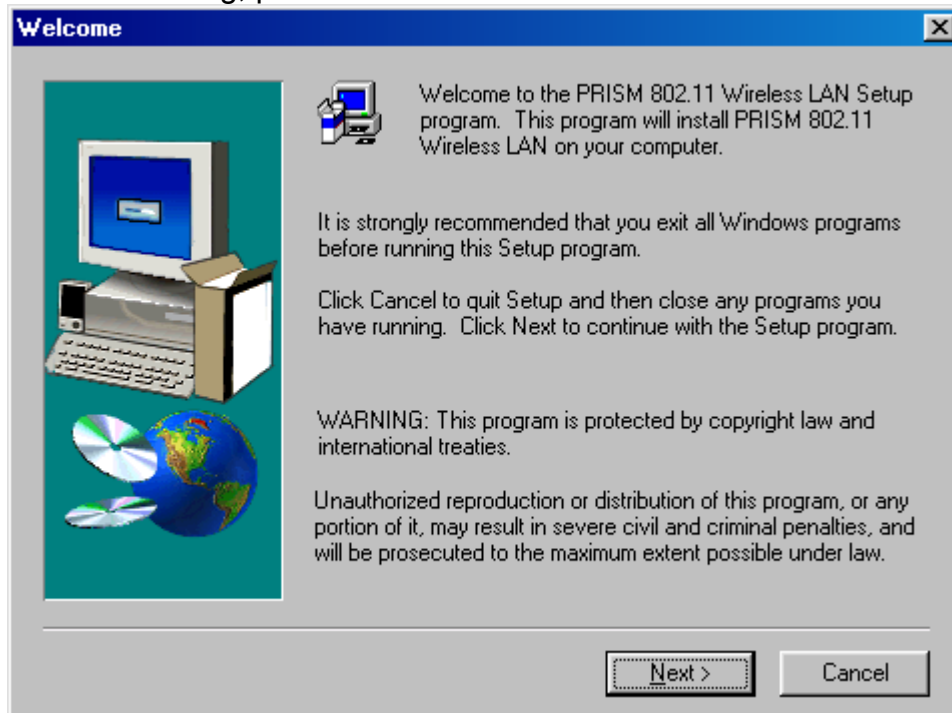
Step 4. Software License Agreement, click **Yes**.
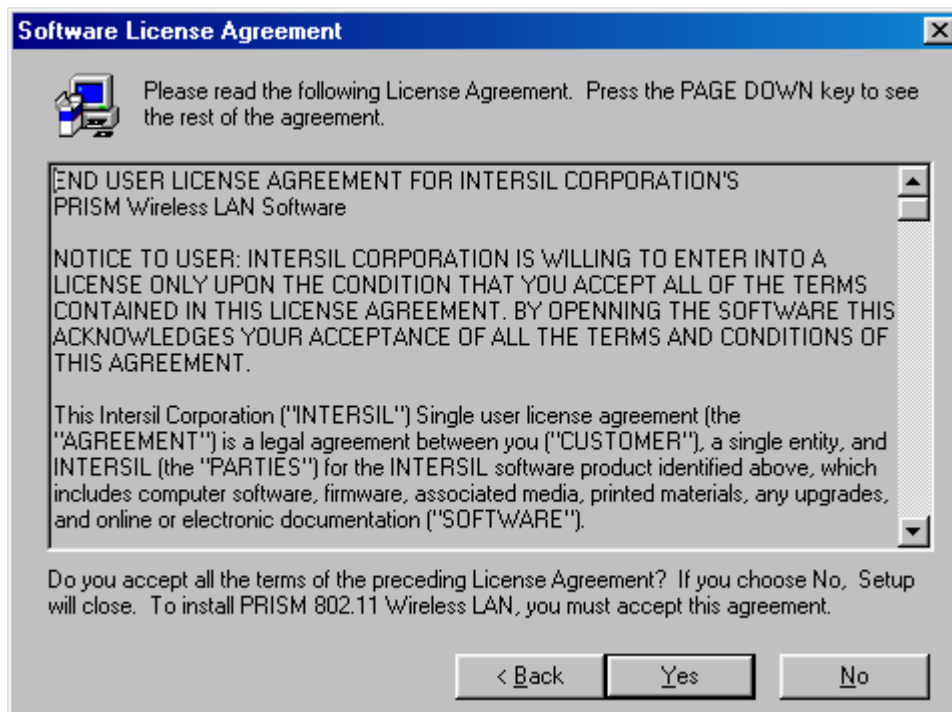
Step 5.   Type in an **SSID**. The System ID (or SSID) is the name for your Wireless LAN. All computers that are to be part of the same wireless LAN must have the same SSID. Click **Next**.
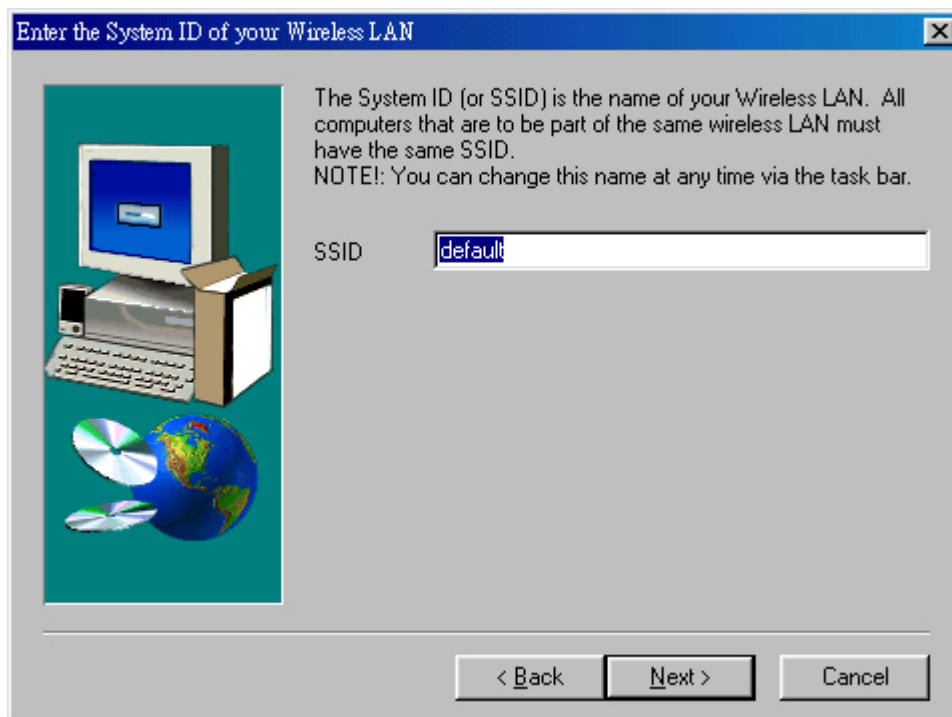
Step 6.   Choose the Network Mode in which your wireless Mode will operate, click **Next**.
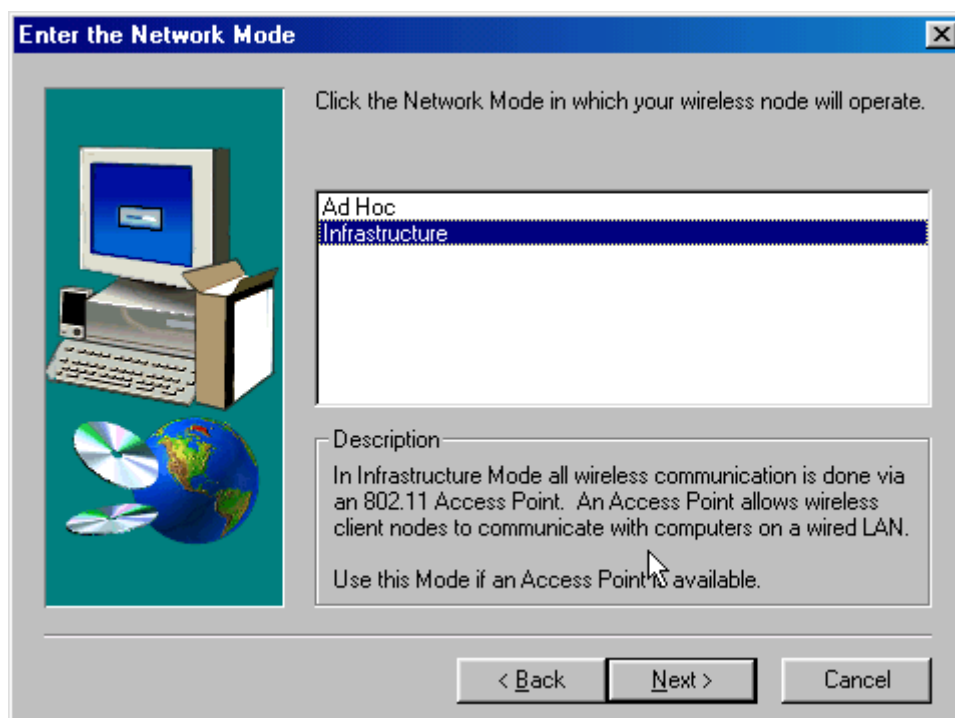
Step 7. Choose **Destination Location**, click **Next**.
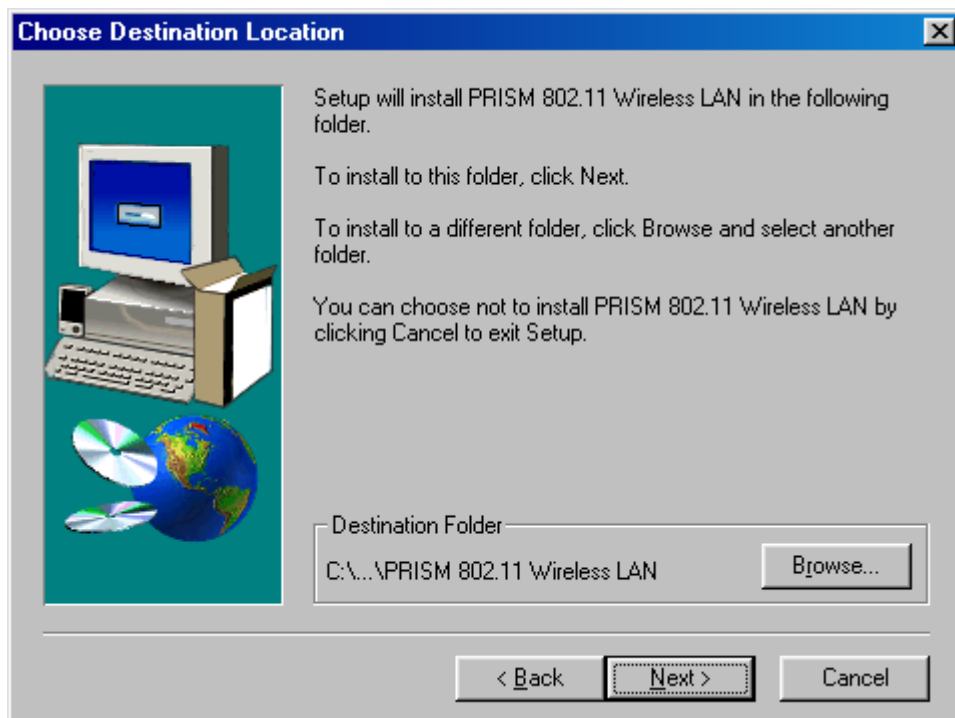
Step 8. Click **Next**
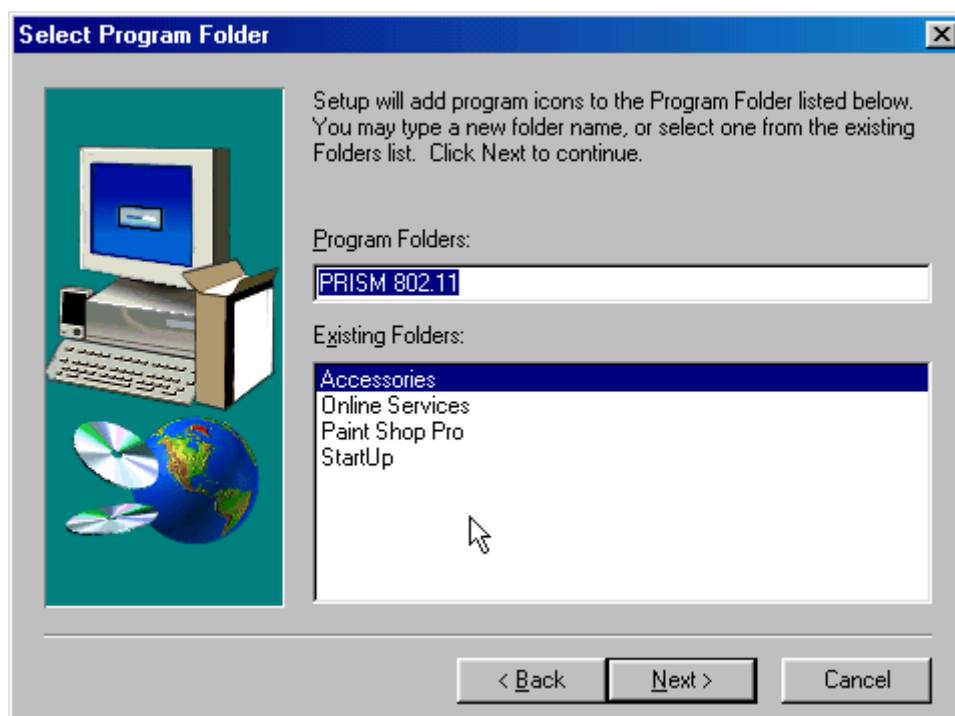
Step 9. Starting Copy.
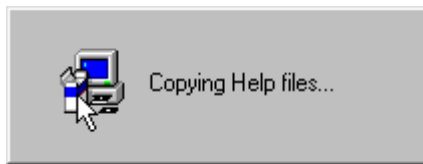
Step 10. Click **Finish** to restart your computer.
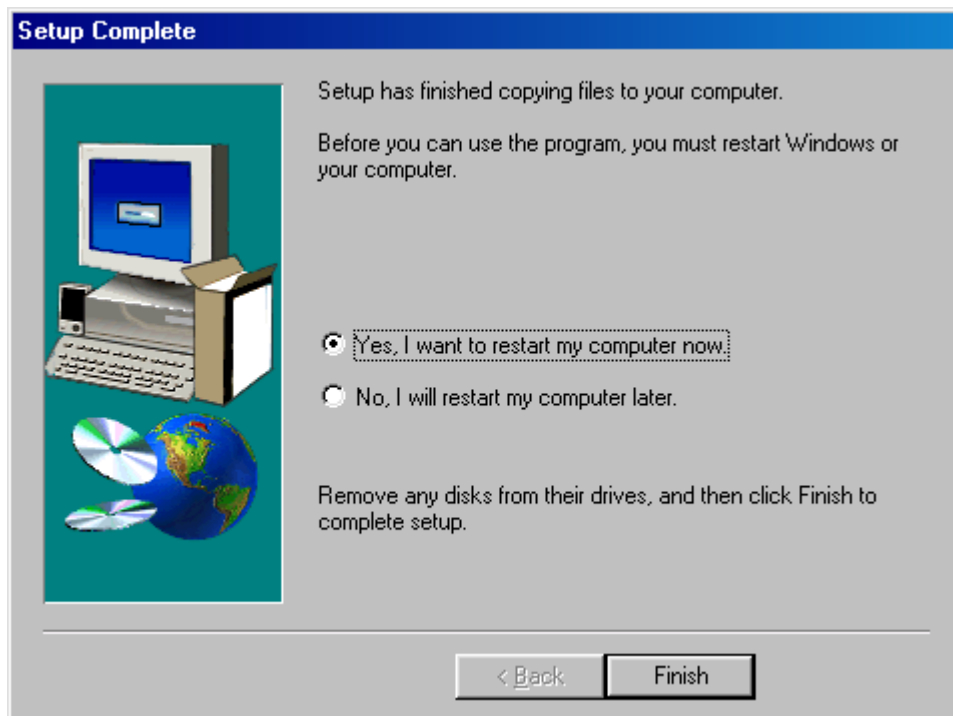
3.4 Configuration Utility

WLAN PC Card uses its own management software. All functions controlled by user are provided by this application. When you insert the WLAN PC card into the PCMCIA slot, a new icon- [icon] 10:52 PM should appear in your icon tray automatically wait a while. If the icon is in red, it means that WLAN PC Card configuration is invalid or incomplete.

Double click on that icon will show you the screen as shown below.
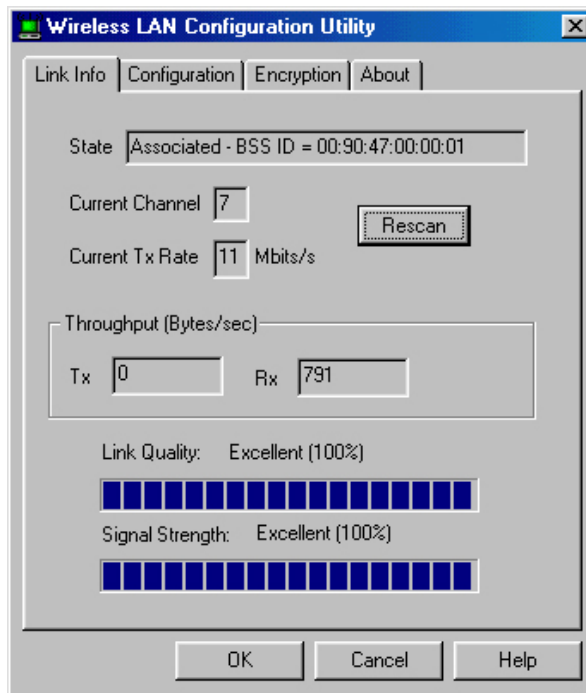
User can navigate through "cards", by clicking or tapping them with a stylus. Following we explain the use and meanings of the various screen messages.

Link Info

State

The field shows the association to available Access Point with BSSID, MAC ID of WLAN PC Card. When the state is "Associated" means normal flow of operation in infrastructure mode. The PC is connected to Access Point. BSSID is chose in the form of hex digits. Networking is available.

Tx/Rx Rate Information

This displays the instantaneous wireless Receive and Transmit throughput in bytes per second. These values are updated every two seconds.

Link Quality / Signal Strength

The Link Quality and Signal Strength bar graph is only active when the node is in Infrastructure Mode. The bar graph displays the quality and strength of the link between the node and its Access Point. A label summarizes the quality of the Link over the bar graph, which can take on one of the following values:

"Not Applicable"
"Poor"
"Fair"
"Good"
"Excellent"

The driver will start looking for a better Access Point if the Link Quality becomes "Poor". Link Quality is a measure of receiving and transmitting errors over the radio.

Configuration

The Configuration Tab contains several fields where operating parameters of the driver can be viewed or changed. Changes to any of the parameters in this panel can be applied to the driver without a need to restart the PC.
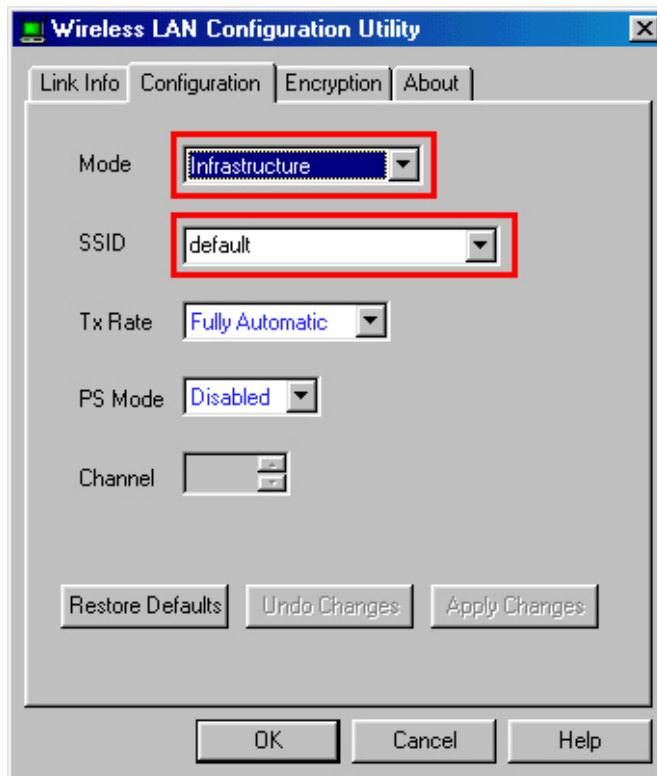
Network Mode

This field allows you to select from a list of supported Network "Modes". The modes displayed will have three values: "Infrastructure", "802.11 Ad Hoc".

Infrastructure-

> The infrastructure mode of operation requires the presence of an 802.11b Access Point. All communication is done via the Access Point, which relays packets to other wireless clients in the BSS as well as to modes on a wired network such as Ethernet.

802.11 Ad Hoc-

> This is the 802.11b peer-to-peer mode of operation. All communication is done from Client to Client without the use of an Access Point. 802.11 Ad Hoc networking uses the same SSID for establishing the wireless connection. In this mode the Channel number will be found automatically.

SSID

SSID is the group name that will be shared by every member of your wireless network. You will only be able to connect with an Access Point, which has the same SSID.

Tx Rate

The transmission rate at which client of AP transmits the data packets. You can set this to fixed 1Mbps, 2Mbps, 5.5Mbps, 11Mbps or Fully Automatic.

"*Apply Changes*" button

This button becomes active only when one of the fields has been modified. Pressing this button applies the changed values to the driver and saves them to the registry for the next time the PC boots up

Encryption

You may desire an additional measure of security on your wireless network, which can be achieved by using WEP (Wired Equivalent Privacy) encryption. WEP encrypts each frame transmitted from the radio using one of the Keys entered from this panel.

When an encrypted frame is received it will only be accepted if it decrypts correctly. This will only happen if the receiver has the WEP Key used by the transmitter.

To be written to the driver and registry, each key must consist of hex digits, which means that only digit 0-9 and letters A-F are valid entries. If entered incorrectly program will not write keys to a driver.

You can set this to disable, 64 bits or 128 bits.

Encryption WEP - disable
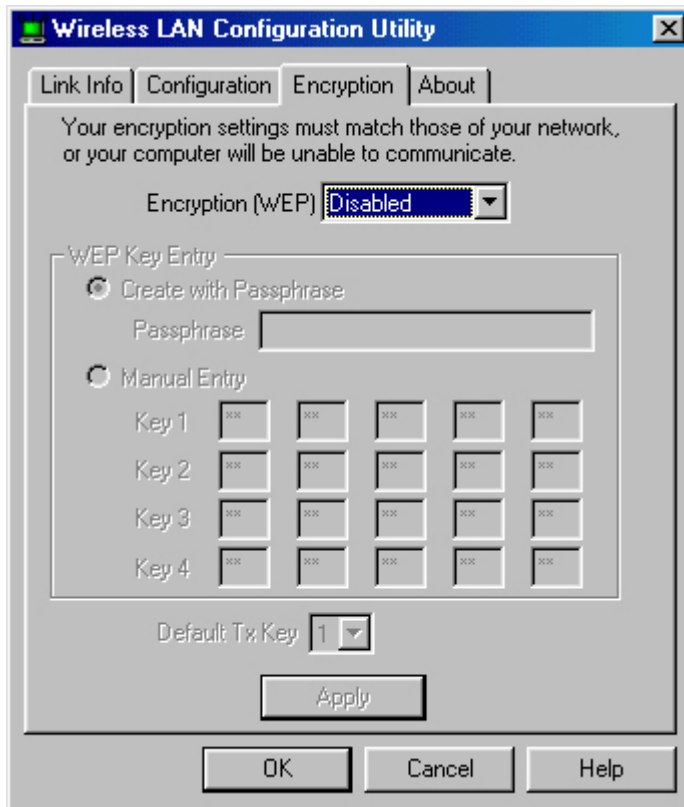
Encryption WEP – 64 bit / 128 bit

There are two options to entry WEP Key. In Create with Passphrase option, you have to type in 5 Hex digital, then Key number will found automatically.
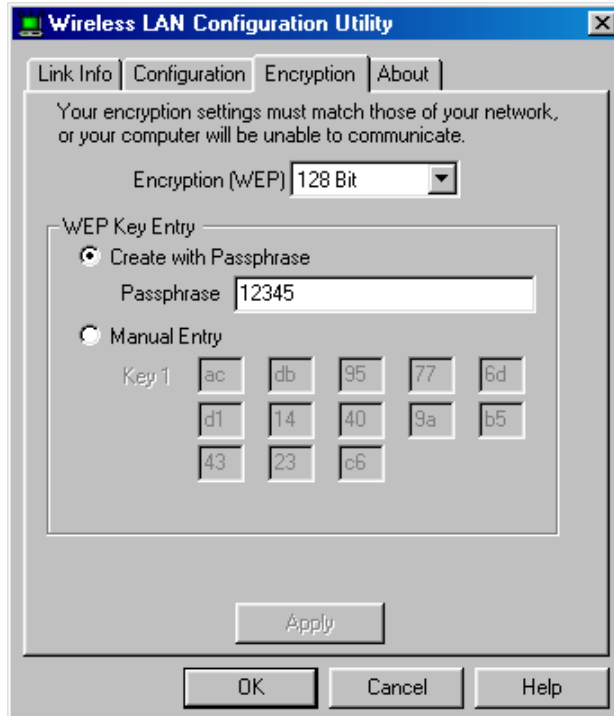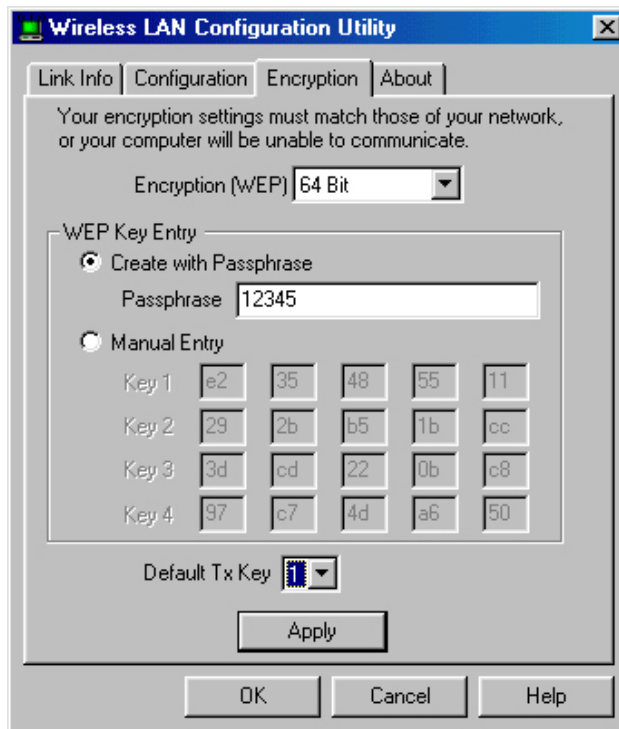
Encryption WEP – 64 bit / 12 8bit

In Manual Entry, there are four fields can be used to manually enter 2 Hex digital in each blanket boxes. This may be necessary if you wish this node to match keys in different vendor's product.
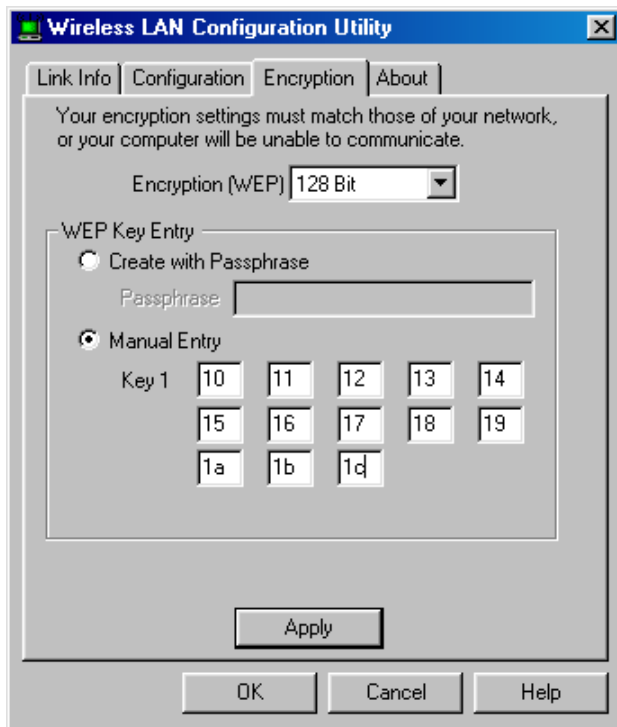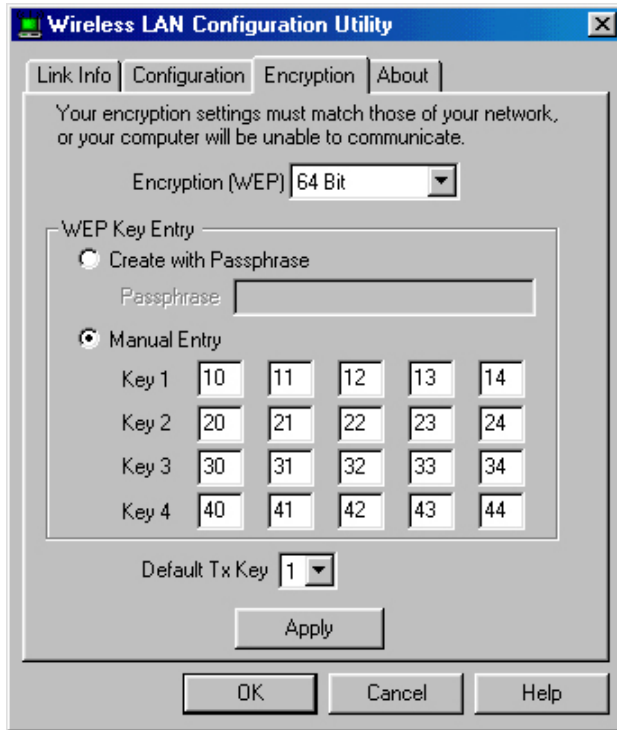
Apply
This button updates the driver with the four keys displayed in Key field.
The keys are also written to the registry for permanent storage.

About

About tab shows the product version including the detail of Driver, Configuration Utility, and NIC firmware version. Users must use this version number when reporting their problems for technical support.

4.   Technical Specifications of WLAN PC Card

Driver Supported

Microsoft Windows 98 / Windows 98 SE / Windows ME / Windows 2000 / Windows XP / RedHat Linux 6.X

Standards Supported

IEEE 802.11b standard for Wireless LAN
Compliant with ETS 300-328, ETS 300-826 and EN60950.
Compliant with FCC Part 15

Radio Specifications

Frequency Range: 2.4-2.4835 GHz, Direct Sequence Spread Spectrum
Antenna system: Two integrated antenna
Mobility: Seamless roaming across cell boundaries with handover

Power Specifications

Operating Voltage: +3.3 / 5 Voltage DC
Continuous Transmitting: 330mA
Continuous Receiving: 280mA

Specific Features

Supported bit rates: 11Mbps, 5.5Mbps, 2Mbps and 1Mbps

Number of Channels

Europe: CH 1-13
US: CH 1-11
France: CH 10-13
Japan: CH 1-14

Troubleshooting

Symptom:
The LED is off.
Possible Remedy:
Make sure the PC Card is inserted properly. Otherwise contact your vendor.

Symptom:
The LED is always on not blinking.
Possible Remedy:
Make sure that you have installed the driver from attached CD. Otherwise contact your vendor.

Symptom:
The LED is blinking but the PC Card icon does not appear in your icon tray.
Possible Remedy:
Make sure that you have installed the Utility from attached CD.

Symptom:
The PC Card icon is red.
Possible Remedy:
It means there is no wireless link.
1. Make sure there is any 802.11b device in the servicing area.
2. Double click the icon to pop up the configuration window
    a. Make sure they are sharing the same SSID and channel. If the SSID is same, you could press the **Link Info** → **Re-Scan** to scan the channel to link.
    b. Make sure they are operating under same authentication type. WEP function has to be enabled, if Shared Key Authentication is the selection, and the secret Keys have to be same in the communicating group.
3. Position the antenna to gain the maximum RF power and make sure there is no metal objects, electron devices or cordless phone in the vicinity.

Symptom:

The PC Card icon is green, but can't access wired-LAN

Possible Remedy:

1. Make sure there is any 802.11b AP in your LAN.

2. Make sure the PC Card is configured as infrastructure mode.

3. Make sure the Network setting is proper. You could check and modify through **My Computer → Control Panel → Network → TCP/IP / NetBEUI → PRISM2 IEEE 802.11 PC Card Adaptor → Content**.

Symptom:

The PC Card icon is green, but can't share files with others.

Possible Remedy:

Make sure the **file and printer sharing** function is enabled. You could enable the function by checking the icon of **My Computer → Control Panel → Network → file and printer sharing → I want to be able to give others to access to my files**.

Symptom:

Slow or erratic performance

Possible Remedy:

Try change the channel of the communicating group or move your device closer to the communicating device.

Glossary

IEEE 802.11 Standard

The IEEE 802.11 Wireless LAN standards subcommittee, which is formulating a standard for the industry.

Access Point

An internetworking device that seamlessly connects wired and wireless networks together.

Ad Hoc

An Ad Hoc wireless LAN is a group of computers, each with a WLAN adapter, connected as an independent wireless LAN. Ad Hoc wireless LAN is applicable at a departmental scale for a branch or SOHO operation.

BSSID

A specific Ad Hoc LAN is called a Basic Service Set (BSS). Computers in a BSS must be configured with the same BSSID.

DHCP

Dynamic Host Configuration Protocol - a method in which IP addresses are assigned by server dynamically to clients on the network. DHCP is used for Dynamic IP Addressing and requires a dedicated DHCP server on the network.

Direct Sequence Spread Spectrum

This is the method the wireless cards use to transmit data over the frequency spectrum. The other method is frequency hopping. Direct sequence spreads the data over one frequency range (channel) while frequency hopping jumps from one narrow frequency band to another many times per second.

ESSID

An Infrastructure configuration could also support roaming capability for mobile workers. More than one BSS can be configured as an Extended Service Set (ESS). Users within an ESS could roam freely between BSSs while served as a continuous connection to the network wireless stations and Access Points within an ESS must be configured with the same ESSID and the same radio channel.

Ethernet

Ethernet is a 10/100Mbps network that runs over dedicated home/office wiring. Users must be wired to the network at all times to gain access.

Gateway

A gateway is a hardware and software device that connects two dissimilar systems, such as a LAN and a mainframe. In Internet terminology, a gateway is another name for a router. Generally a gateway is used as a funnel for all traffic to the Internet.

IEEE

Institute of Electrical and Electronics Engineers

Infrastructure

An integrated wireless and wired LAN is called an Infrastructure configuration. Infrastructure is applicable to enterprise scale for wireless access to central database, or wireless application for mobile workers.

ISM Band

The FCC and their counterparts outside of the U.S. have set aside bandwidth for unlicensed use in the so-called ISM (Industrial, Scientific and Medical) band. Spectrum in the vicinity of 2.4 GHz, in particular, is being made available worldwide. This presents a truly revolutionary opportunity to place convenient high-speed wireless capabilities in the hands of users around the globe.

Local Area Network (LAN)

A LAN is a group of computers, each equipped with the appropriate network adapter card connected by cable/air, that share applications, data, and peripherals. All connections are made via cable or wireless media, but a LAN does not use telephone services. It typically spans a single building or campus.

Network

A network is a system of computers that is connected. Data, files, and messages can be transmitted over this network. Networks may be local or wide area networks.

PCMCIA

Personal Computer Memory Card International Association. Also a PCMCIA card is also referred to PC Card.

Protocol

A protocol is a standardized set of rules that specify how a conversation is to take place, including the format, timing, sequencing and/ or error checking.

Roaming

In an infrastructure network, this is when a wireless PC moves out of range of the previously connected access point and connects to a newly connected access point. Throughout the network environment where access point are deployed, PCs can always be connected regardless of where they are located or roam.

SSID

A Network ID unique to a network. Only clients and Access Points that share the same SSID are able to communicate with each other. This string is case-sensitive.

Simple Network Management Protocol (SNMP)

Simple Network Management Protocol is the network management protocol of TCP/IP. In SNMP, agents-which can be hardware as well as software-monitor the activity in the various devices on the network and report to the network console workstation. Control information about each device is maintained in a structure known as a management information block.

Static IP Addressing

A method of assigning IP addresses to clients on the network. In networks with Static IP address, the network administrator manually assigns an IP address to each computer. Once a Static IP address is assigned, a computer uses the same IP address every time it reboots and logs on to the network, unless it is manually changed.

Transmission Control Protocol / Internet Protocol (TCP/IP)

TCP/IP is the protocol suite developed by the Advanced Research Projects Agency (ARPA). It is widely used in corporate Internet works, because of its superior design for WANs. TCP governs how packet is sequenced for transmission the network. The term "TCP/IP" is often used generically to refer to the entire suite of related protocols.

Transmit / Receive

The wireless throughput in Bytes per second averaged over two seconds.

Wide Area Network (WAN)

A WAN consists of multiple LANs that are tied together via telephone services and / or fiber optic cabling. WANs may span a city, a state, a country, or even the world.

Wireless LAN (WLAN)

A wireless LAN does not use cable to transmit signals, but rather uses radio or infrared to transmit packets through the air. Radio Frequency (RF) and infrared are the commonly used types of wireless transmission. Most wireless LANs use spread spectrum technology. It offers limited bandwidth, usually under 11Mbps, and users share the bandwidth with other devices in the spectrum; however, users can operate a spread spectrum device without licensing from the Federal Communications Commission (FCC)